

classifying the defect as being in one of an arbitrary number of variant subclasses using a specific adaptive classifier associated with the one core class and associated with less than the predetermined number of core classes, the specific adaptive classifier being a non rule-based classifier trained by the user with a set of sample defect images.

10. (Twice Amended) An apparatus for classifying a defect on the surface of an article, comprising:

an imager to produce an image of the defect; and

a processor comprising:

a rule-based core classifier for classifying the defect as being in one of a predetermined number of core classes of defects, and

a specific adaptive classifier associated with the one core class and associated with less than the predetermined number of core classes for classifying the defect as being in one of an arbitrary number of variant subclasses, the specific adaptive classifier being a non ruled-based classifier trained by the user with a set of sample defect images.

19. (Twice Amended) A non rule-based specific adaptive classifier, trained by the user with a set of sample defect images, for classifying a defect on the surface of an article as being in one of an arbitrary number of variant subclasses of a core defect class of a predetermined number of core classes, the specific adaptive classifier being associated with less than the predetermined number of core classes and responsive to a rule-based core classifier for classifying the defect as being in the core class.